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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,772	10/29/2003	Patrick L. Chapman	1201.68289	7885
7590 02/09/2006				
GREER, BURNS & CRAIN, LTD. Suite 2500 300 South Wacker Drive Chicago, IL 60606			EXAMINER DEBERADINIS, ROBERT L	
			ART UNIT 2836	PAPER NUMBER

DATE MAILED: 02/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

21

<b>Office Action Summary</b>	<b>Application No.</b> 10/696,772	<b>Applicant(s)</b> CHAPMAN ET AL.	
	<b>Examiner</b> Robert DeBeradinis	<b>Art Unit</b> 2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 November 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5 and 8-38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 29-36 is/are allowed.
- 6) ☒ Claim(s) 1-4, 9-28, 37, 38 is/are rejected.
- 7) ☐ Claim(s) 5 and 8 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>4/2/04</u> | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

The reply filed 11/25/05 consists cancellation of claims 6, 7, amending independent claims 1, 15, 26, 29, 31 and remarks related to rejection of claims.

#### ***Response to Arguments***

Applicant's arguments, see arguments, filed 9/25/05, with respect to the rejection(s) of claim(s) independent claims under KING have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of HACK 6,894,461.

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1-4, 13, 14, 37, 38 are rejected under 35 U.S.C. 102(b) as being anticipated by HACK 6,894,461.

Regarding claim 1, 13, 14, 37, 38.

HACK discloses a buck-boost converter for converting a plurality of dc voltages from a plurality of voltage sources to at least one dc output voltage, the converter comprising: a plurality of voltage inputs (fig. 3, B<sub>n</sub>); a respective current-conducting-bidirectional-voltage-blocking switch in an electrical path from each of said inputs (S<sub>n</sub>); a magnetically inductive device in an electrical path from each of said current

Art Unit: 2836

conducting-bidirectional-voltage-blocking switches; and a voltage output bucked or boosted relative to one of said voltage inputs in an electrical path from said magnetically inductive device.

Regarding claim 2.

HACK teaches bidirectional power conversion. Power flowing from Bo to Bn provides a plurality of voltage outputs.

Regarding claim 3.

HACK teaches magnetically inductive device comprises an inductor (320).

Regarding claim 4.

HACK teaches magnetically inductive device comprises a transformer (420).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 9, 10, 11, 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over HACK 6,894,461.

Regarding claims 9, 10, 11, 12.

HACK teaches the converter of claim 1.

HACK is silent wherein each of said current-conducting-bidirectional-voltage-blocking switches is switched on substantially simultaneously with a switch signal and each switch having an effective duty cycle defined by the given equations.

HACK discloses a bidirectional power conversion with multiple control loops wherein the control loops modulate a pulse width to set an output voltage to a desired level.

It would have been obvious to one having ordinary skill in the art at the time of this invention to switch the switches at substantially at the same time and to pulse width modulate each of the switches. The motivation would be to use only one control signal to switch on the switches and to turn each switch off at a different time to set a different voltage level for each switch output.

Claims 15-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over HACK 6,894,461 in view of KING 5,710,699.

Regarding claims 15-25.

HACK teaches a converter for providing dc power from more than one source to at least one load.

HACK does not teach at least one output bucked or boosted relative to one of said inputs for at least one load in parallel with a capacitor in series with a diode to said magnetically inductive device.

KING teaches a converter having a capacitor in series with a diode to said inductive device connected (figure 1).

Art Unit: 2836

It would have been obvious to one having ordinary skill in the art at the time of this invention to modify the bidirectional power conversion system to include the above configuration. The motivation would be to smooth the output of the bidirectional power conversion system.

Regarding claims 26-28.

HACK discloses a buck-boost system for supplying power to a load from a plurality of sources.

HACK does not disclose a magnetically inductive device in an electrical path from each of said current conducting bidirectional-voltage-blocking-switches.

KING teaches plural sources each providing power to a converter each converter having a current conducting bidirectional-voltage-blocking-switch and each current conducting bidirectional-voltage-blocking-switch having a magnetically inductive device in its path.

It would have been obvious to one having ordinary skill in the art at the time of this invention to have modified the bidirectional power conversion system to have a magnetically inductive device in each path. The motivation would be to have independent converters for each control loop.

***Allowable Subject Matter***

Claims 29-36 allowed.

Art Unit: 2836

The following is a statement of reasons for the indication of allowable subject matter: the prior art of record does not disclose or suggest, inter alia a buck-boost converter comprising;

a plurality of rechargeable voltage sources arranged serially in an electrical path wherein said current output is fed back to a rechargeable voltage source that is not comprised in said all excepting at least one of said rechargeable voltage source.

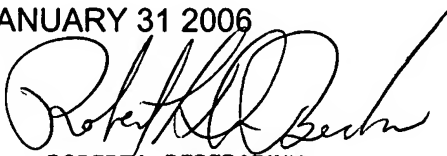
Claims 5, 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication should be directed to Robert L. DeBeradinis whose number is (571) 272-2049. The Examiner can normally be reached Monday-Friday from 8:30 am to 5:00 pm.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Brian Sircus, can be reached on (571) 272-2058. The Fax phone number for this Group is (703) 872-9306.

RLD

JANUARY 31 2006

  
ROBERT L. DEBERADINIS  
PRIMARY EXAMINER